

This listing of claims will replace all prior versions of claims in the application.

Claim 1. (original) A method for assembling a modulatable fusion molecule, comprising:

randomly inserting an insertion sequence into an acceptor sequence, wherein the insertion sequence and the acceptor sequence each comprise a state, thereby generating a fusion molecule; and

selecting a fusion molecule wherein insertion couples the state of the insertion sequence to the state of the acceptor sequence.

Claim 2. (original) The method according to claim 1, wherein the state of the insertion sequence is modulated.

Claim 3. (original) The method according to claim 2, wherein the state of the insertion sequence is modulated in response to a change in the state of the acceptor sequence.

Claim 4. (original) The method according to claim 1, wherein the state of the acceptor sequence is modulated.

Claim 5. (original) The method according to claim 4, wherein the state of the acceptor sequence is modulated in response to a change in the state of the insertion sequence.

Claim 6. (original) The method according to claim 1, wherein the fusion molecule comprises a new state.

Claim 7. A method for assembling a fusion molecule comprising an insertion site, the method comprising:
inserting an insertion sequence into an acceptor sequence, thereby generating a

fusion molecule, wherein the insertion sequence and the acceptor sequence each comprise a state;

generating a duplication, deletion, or substitution, at the insertion site in the acceptor sequence; and;

selecting a fusion molecule wherein insertion couples the state of the insertion sequence to the state of the acceptor sequence.

Claim 8. (original) The method according to claim 7, wherein the generating step occurs prior to the inserting step.

Claims 9-13. (cancelled)

Claim 14. (original) A method for assembling a multistable fusion molecule which can switch between at least an active state and a less active state, comprising:

randomly inserting an insertion sequence into an acceptor sequence, thereby generating a fusion molecule, wherein either the insertion sequence or the acceptor sequence comprises a state; and wherein the respective other sequence is responsive to a signal;

selecting a fusion molecule, wherein the state is coupled to the signal, such that the fusion molecule switches state in response to the signal.

Claims 15-25. (cancelled)

Claim 26. (currently amended) A method for modulating a cellular activity, comprising:
providing a fusion molecule generated according to the method of claim 1 any of ~~claims 1, 7, 14, and 15~~ to a cell, wherein a change in state of at least the insertion sequence or the acceptor sequence modulates a cellular activity, and wherein the change in state which modulates the cellular activity is coupled to a change in state of the respective other portion of the fusion molecule; and

changing the state of the respective other portion of the fusion molecule, thereby modulating the cellular activity.

Claims 27-29. (cancelled)

Claim 30. (original) A method for modulating a molecular pathway in a cell, comprising:

providing a fusion molecule to the cell, the fusion molecule comprising an insertion sequence and an acceptor sequence,

wherein the activity of the insertion sequence and acceptor sequence are coupled, and responsive to a signal, and

wherein the activity of either the insertion sequence or the acceptor sequence modulates the activity or expression of a molecular pathway molecule in the cell; and exposing the fusion molecule to the signal.

Claim 31. (cancelled)

Claim 32. (original) A fusion molecule, comprising:

an insertion sequence and an acceptor sequence,

wherein either the insertion sequence or the acceptor sequence transports the fusion molecule intracellularly and wherein intracellular transport of the fusion molecule is coupled to binding of the fusion molecule to a bio-effective molecule.

Claims 33-37. (cancelled)

Claim 38. (original) A sensor molecule, comprising:

an insertion sequence and an acceptor sequence,

wherein either the insertion sequence or acceptor sequence binds to a target molecule,

wherein the respective other sequence generates a signal in response to binding,
and further,
wherein the acceptor sequence comprises a deletion, duplication, and or
substitution at the insertion site.

Claim 39. (original) A library, comprising a plurality of library members,
wherein each library member comprises a first nucleic acid sequence encoding a first
polypeptide having a first state, the first nucleic acid sequence being inserted into a
second nucleic acid sequence encoding a second polypeptide having a second state, at a
random insertion site in the second nucleic acid sequence, and wherein the library
comprises members comprising insertions with deletions at the insertion site, insertions
with tandem duplications at the insertion site, and insertions with neither duplications nor
deletions.

Claim 40. (cancelled)

Claim 41. (original) A method for generating a conditional heterodimer, comprising:
providing a plurality of randomly bisected molecules;
each bisected molecule comprising a first half and a second half, wherein the first
and second half are fused to first and second dimerization domains respectively, and
wherein a function of the bisected molecule is altered by bisection,
selecting for restoration of function of a bisected molecule in response to a signal.

Claims 42-44. (cancelled)